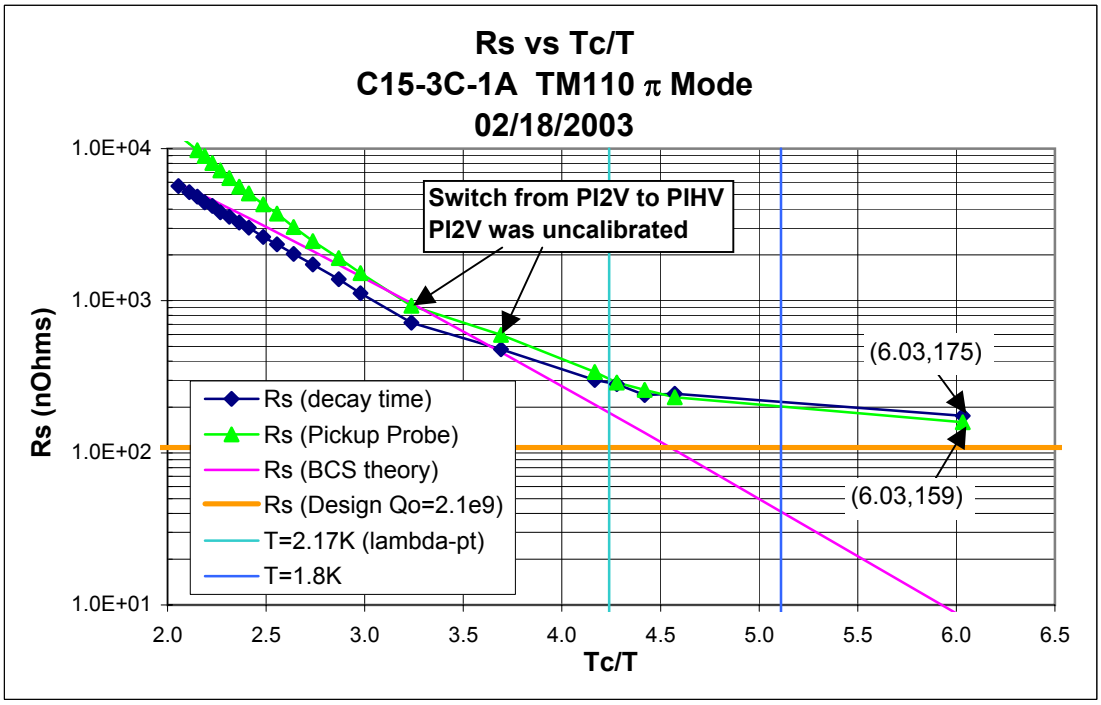
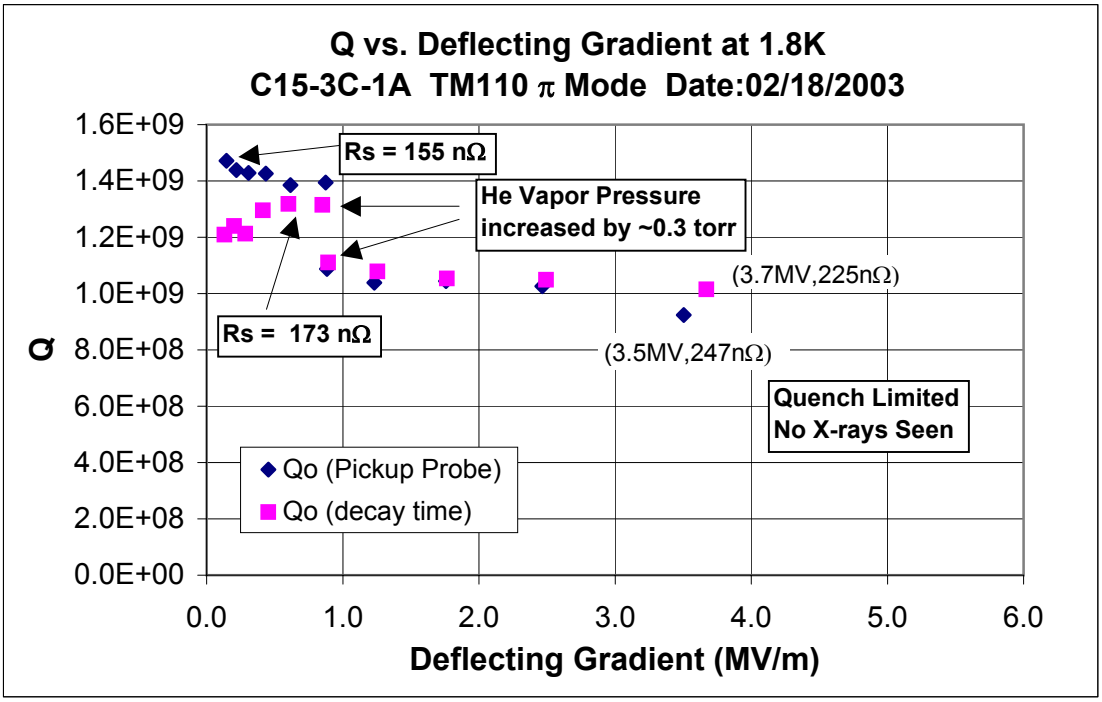

RMU-03
Kimwipes EX-L


Rs vs Tc/T
C15-3C-1A TM110 π Mode
02/18/2003
Switch from PI2V to PIHV
PI2V was uncalibrated
(6.03,175)
(6.03,159)
Rs (decay time)
Rs (Pickup Probe)
Rs (BCS theory)
Rs (Design Qo=2.1e9)
T=2.17K (lambda-pt)
T=1.8K
Rs (nOhms)
1.0E+04
1.0E+03
1.0E+02
1.0E+01
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
Tc/T


Q vs. Deflecting Gradient at 1.8K
C15-3C-1A TM110 π Mode Date:02/18/2003
Rs = 155 nΩ
He Vapor Pressure
increased by ~0.3 torr
(3.7MV,225nΩ)
Rs = 173 nΩ
(3.5MV,247nΩ)
Quench Limited
No X-rays Seen
Qo (Pickup Probe)
Qo (decay time)
Q
1.6E+09
1.4E+09
1.2E+09
1.0E+09
8.0E+08
6.0E+08
4.0E+08
2.0E+08
0.0E+00
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Deflecting Gradient (MV/m)

Cavity History Summary
CKM - SCRF 3.9GHz Transverse Mode Cavity

Cavity Description					Cleaning Treatment Summary					RFMeasurement Summary								
CAVITY	BEAM TUBE ID (*mm*)	PULL-OUTS	WELDING COMPLETED	Rs @Qo = 2.1e9 (nΩ)	CHEMICAL TREATMENT	ETCH DETAILS	HIGH PRESSURE RINSE @JLAB	HIGH PRESSURE RINSE @A0	HEAT TREATMENT DETAILS	RF Test Date	Resonant Frequency (MHz)	Rs (nΩ)	$E_{D\ Max}$ (MV/m)	X-Rays	T @Freq (K)	T @Rs (K)	T @$E_{D\ Max}$ (K)	Rs correct * (nΩ)
A15-5C-1o	30	NO		112	??	??	??	??	??	1/31/2001	N/A	330	N/A	N/A	N/A	1.53	N/A	
					JLAB prior to 5/22/2001	??	??	??	??	5/22/2001	3908.953	??	??	??	??	??	??	
C15-1C-1A	30	NO	11/17/2000	121	JLAB prior to 2/8/2001	102 μm	Yes ?Time?	?	?	3/14/2001	3946.3	120	??	Yes	?	1.8	N/A	
								< 4/26/2001		4/26/2001	3964.531	118	9.7	Yes	1.8	1.8	1.8	
										5/1/2001	N/A	5500	N/A	??	N/A	2.0	N/A	
					JLAB - 7/29/01	137 μm	20 min	??		8/31/2001	N/A	1420	N/A	??	N/A	1.89	N/A	
										9/4/2001	3959.690	990	6.3	Yes	1.79	1.8	1.79	
					JLAB - 10/12/01	4 x 1 minute BCP @ 6.2 μm/min Tot.= 25 μm	15 min	10/19/2001	JLAB - 800 C - 6 hrs	11/1/2001	3954.240	180	5.9	No	1.73	1.77	1.79	
C15-1C-2A	30	YES	3/23/2001	121						8/24/2001	3955.690	22350	N/A	N/A	1.83	1.83	N/A	
										9/18/2001	3954.000	8500	1.4	??	1.75	1.86	1.76	
					JLAB - 10/12/01	4 x 1 minute BCP @ 6.2 μm/min Tot.= 25 μm	15 min		JLAB - 800 C - 6 hrs	11/15/2001	3950.980	206	6.0	No	1.71	1.71	1.79	
										11/16/2001	3950.930	190	5.9	No	1.70	1.70	1.79	
C15-13C-1A	36	YES	8/27/2001	109						6/27/2002	3930.016	1390	2.6	No	1.89	1.89	1.91	
C15-1C-3A	36	NO	10/17/2001	121	JLAB - 02/06/02	4 x 1 minute BCP @ 5.4 μm/min Tot.=22 μm	15 min		JLAB - 600 C - 10 hrs									
								10/21/2002 20up/20dwn	A0 - 150C Wrap Bake 10/30/2002 - 11/3/2002	11/7/2002	3976.415	1042	5.4	Once	1.78	1.79	1.80	731
C15-3C-1A	36	NO	11/15/2001	109	JLAB - 02/06/02	4 x 1 minute BCP @ 5.4 μm/min Tot.=22 μm	15 min	2/17/2001	JLAB - 600 C - 10 hrs	2/23/2002	3930.583	234	5.1	No	1.78	1.81	1.79	137 / 55
										3/15/2002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
										5/1/2002	3930.186	265	4.8	No	1.78	1.79	1.78	168
					JLAB - 05/30/02	4 x 3 minutes BCP @ 5.8 μm/min Tot.=70 μm	60 min			7/15/2002	3923.339	278	3.9	No	1.77	1.79	1.79	181
								9/3/2002 20up/20dwn		10/2/2002	3923.307	298	3.4	No	1.79	1.79	1.79	201
								11/19/2002 20up/20dwn	11/15/2002 Fermi 2 hrs @ 800 C	12/4/2002	3923.838	265	3.6	No	1.78	1.78	1.78	168
	Pickup Probe Flange Changed to VPP-4B									12/20/2002	3923.830	196	3.7	No	1.74	1.79	1.80	
	Input Coupler Changed to VIC-4									2/18/2003	3922.986	173	3.5	No	1.79	1.79	1.79	
C15-9C-1B	36	YES	7/19/2002															

Cavity Notation: XXX-nC-sm

XXX = profile shape
n = number of cells
s = serial number (chronological order of fabrication)
m = Niobium shipment utilized for fabrication

* See Rs Correction Note Based upon End Effects Extraction One Page 3 of this Cavity History Table

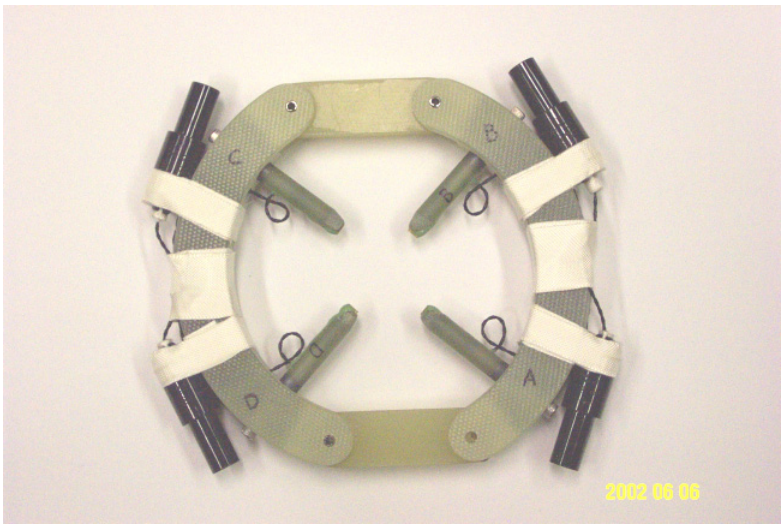
Ruben Carcagno
7/18/02

Temperature Measurements on C15-3C-5
(preliminary note)

Measurements of cavity temperature were performed on C15-3C-5 on 7/17/02. Results were obtained for the following conditions:

- Continuous power (cw) operation
- Pulsed power operation (700 ms period, 250 ms width)
- Quench mode operation (breakdown frequency measured from RF system ~ 9.3 Hz)

Two temperature sensor holders with four CERNOX sensors each like the one shown in the following figure were used:

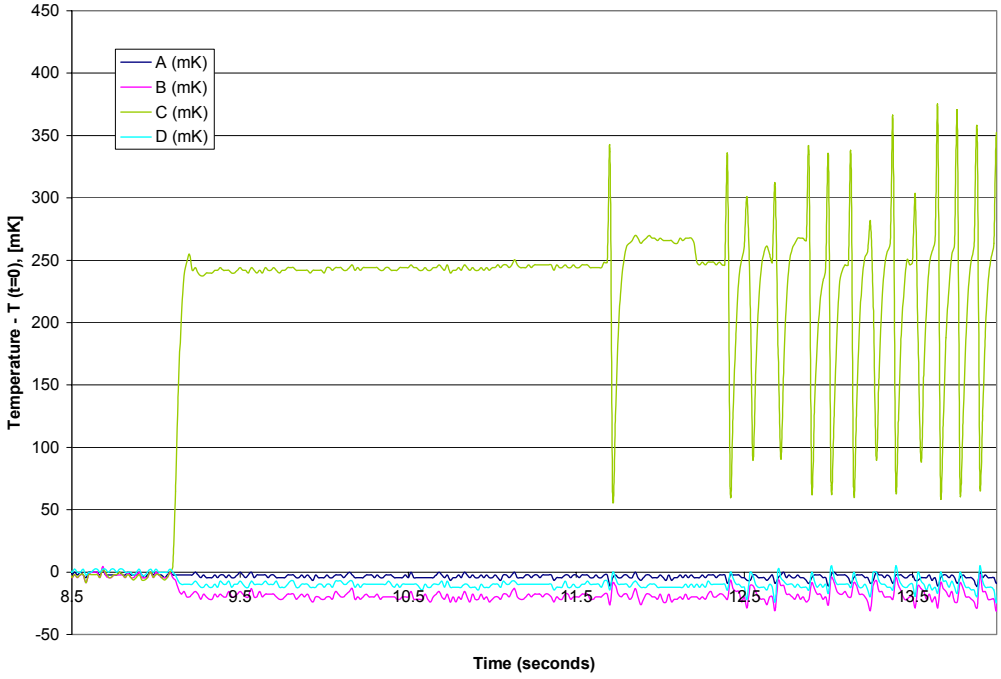


The CERNOX sensors were spring loaded against the cavity iris external wall. Sensors A (E) and C (G) were aligned with the flat portion of the cavity, and sensors B (F) and D (H) were aligned with the circular portion.
The first holder with sensors A, B, C, and D was located between the first and second cell, and the second holder with sensors E, F, G, and H was located between the second and the third cell.

Following is a series of plots showing measurement results for different condition. Note that sensor "C" registered a much higher temperature when power was on, and it responded clearly to quench events. The detail of the quench pulse shows a behavior consistent with crossing the Lambda point at 2.17 K. Another interesting observation is that other sensors show a cooling effect when power was applied, and this result is being analyzed by Moyses to determine if there is a superfluid heat transfer mechanism taking place bringing colder helium to the "hot spot" around the location of sensor C.

This is a preliminary note, and a more detailed presentation of results and analysis will follow.

Onset of Quench Mode
(Breakdown Frequency from RF system ~ 9.3 Hz)



Quench Operation
(10 KHz data acquistion)